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Exhibit R-2, RDT&E Budget Item Justification: PB 2012 Office of Secretary Of Defense	DATE: February 2011
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APPROPRIATION/BUDGET ACTIVITY				R-1 ITEM NOMENCLATURE							
0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 3: <i>Advanced Technology Development (ATD)</i>				PE 0603665D8Z: <i>Biometrics Science and Technology</i>							
COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
Total Program Element	15.967	11.416	10.762	-	10.762	13.417	13.683	13.982	14.408	Continuing	Continuing
P665: <i>Biometrics Science and Technology</i>	15.967	11.416	10.762	-	10.762	13.417	13.683	13.982	14.408	Continuing	Continuing

A. Mission Description and Budget Item Justification

Biometric technology is revolutionizing critical military operations by providing the warfighter with the ability to verify an individual's claimed identity; and, when combined with additional intelligence and/or forensic information, establish an unknown individual's identity which strips away his anonymity. These emerging technologies provide Department of Defense warfighters and commanders with an important capability which supports such missions as detainee management, base access, counterintelligence screening, border control, humanitarian assistance, and displaced persons management.

In Oct 2006, the Deputy Secretary of Defense designated the Director for Defense Research and Engineering (DDR&E) as Principal Staff Assistant (PSA) for biometrics with the responsibility to fully address and exercise control over all facets of the Department's biometrics programs, initiatives, and technologies. A central role of the Biometrics Program is to support the PSA in addressing the technology gaps that preclude our ability to quickly and accurately identify anonymous individuals who threaten our interests, in whatever domain they operate.

Expeditionary forensics is an emerging capability that provides the commander with the ability to attribute enemy activity to a specific individual. Forensics is included within the Biometrics Program as a means to support the increasing requirements to leverage forensic science on the battlefield.

The Biometrics Program develops a comprehensive science and technology (S&T) plan and implements multiple projects to advance capabilities in both biometrics and forensics. This S&T plan includes a portfolio of emerging technologies that will support the evolving capabilities required by the commanders and warfighters in ongoing and future military operations.

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B. Program Change Summary (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total
Previous President's Budget	10.904	11.416	11.568	-	11.568
Current President's Budget	15.967	11.416	10.762	-	10.762
Total Adjustments	5.063	-	-0.806	-	-0.806
• Congressional General Reductions		-			
• Congressional Directed Reductions		-			
• Congressional Rescissions	-	-			
• Congressional Adds		-			
• Congressional Directed Transfers		-			
• Reprogrammings	5.378	-			
• SBIR/STTR Transfer	-0.299	-			
• Defense Efficiency – Report, Studies, Boards and Commissions	-	-	-0.772	-	-0.772
• Economic Assumptions	-	-	-0.034	-	-0.034
• Other internal adjustment	-0.016	-	-	-	-

Change Summary Explanation

FY 2010 funding increase. The adjustment reflects a congressionally approved reprogramming into Biometrics Science and Technology and is reflective of DoD priorities and decisions. Those resources are being directed toward improving the capability to identify, track and target enemy combatants.

FY 2012 funding reduction. Defense Efficiency – Report, Studies, Boards and Commissions. The FY 2012 account reflects a reduction due to the Department of Defense reform agenda, a reduction due to a reduction in the number and cost of reports, studies, DoD Boards and DoD Commissions below the aggregate level reported in the previous budget submission.

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COST (\$ in Millions)	FY 2010	FY 2011	FY 2012 Base	FY 2012 OCO	FY 2012 Total	FY 2013	FY 2014	FY 2015	FY 2016	Cost To Complete	Total Cost
P665: <i>Biometrics Science and Technology</i>	15.967	11.416	10.762	-	10.762	13.417	13.683	13.982	14.408	Continuing	Continuing
A. Mission Description and Budget Item Justification This program will develop the technology that will improve the quality of biometric and forensic derived information provided to the operational forces for the purpose of identifying and classifying anonymous individuals. It will enable execution of a DoD and interagency coordinated science and technology plan that supports technology transition to biometric and forensic acquisition programs in FY 2012 and beyond.											
B. Accomplishments/Planned Programs (\$ in Millions)								FY 2010	FY 2011	FY 2012	
Title: Biometric Information Technology Evaluation (BITE) Description: BITE serves as the focal point for collecting the available information on the deployed biometric and forensic systems, how they are currently used, and how different employment concepts alter performance. Understanding how biometrics contributed in Iraq and how operations are being conducted in Afghanistan will optimize our efforts in theater. The metrics developed under this forensics effort will allow for future assessment and course of action evaluation. The intent of this program is to produce: (1) a detailed simulation of the biometric and forensic operations as they are currently executed in Afghanistan; (2) operationally relevant metrics for the Defense Forensics Enterprise; (3) an analysis of the Iraqi biometric database looking at database size, enrolled populations, technologies, and operations; and (4) recommendations to maximize the biometric and forensic efforts in Afghanistan. FY 2010 Accomplishments: The BITE project: (1) developed initial operational metrics for the Defense Forensics Enterprise; and (2) collected data to develop the simulation environment for biometric and forensic operations in Afghanistan. FY 2011 Plans: The project will focus on three tasks to support the mission in Afghanistan: (1) identify the location and/or mission that generated the most matches to the biometrically enabled watchlist; (2) measure the biometric latency delay for the warfighter in order to guide and focus future improvements; and (3) measure the additional value provided by rolled fingerprints in support of latent matching.								0.840	0.800	-	
Title: Forensics Science and Technology (S&T) Workshop Description: The objective of the Forensic S&T Workshop was to: (1) meet the Director, Defense Research and Engineering (DDR&E) goal of sponsoring semi-annual Forensic S&T symposia as set forth in the DoD Forensics S&T Workshop Report (7 Jan 09); and (2) leverage the DoD and interagency S&T and forensic communities to develop a coordinated and holistic plan								0.050	-	-	

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
and strategy for DoD Forensic S&T investment. The primary payoff of the Forensics S&T Workshop includes determining the direction for investment in validation studies and usable prototypes while determining the direction of the next generation of forensic technology and equipment.			
FY 2010 Accomplishments: The following has been delivered: (1) white papers/quad charts for sponsorship of validated projects for FY 2010; (2) process and strategy for initial investment in FY 2011; (3) vetted requirements generation mechanism; and a (4) Workshop Summary Report.			
Title: Expansion of Biometrics Collection Efforts Description: The intent of this effort is to identify an optimal approach for DoD and the U.S. Intelligence Community (IC) to coordinate and expand the reach and breadth of the IC Identity Intelligence biometrics capability. This includes developing a strategy for engaging with foreign nations on sharing their biometric data with the U.S. Government. The primary objectives associated with this project are: (1) identify U.S. government partners and requirements for initiating sharing agreement development efforts; and (2) develop a strategy outlining how to share biometrics information already being collected through international engagement.		0.210	-
FY 2010 Accomplishments: The project identified efforts already in place to collect biometric information from international countries and developed a prioritized list of countries with which to share biometric information. This enabled the project to develop a strategy for conducting engagement to collect biometric samples from current and potential international partners.			
Title: WARP Network Optimizer Description: The Biometrics Automated Toolset (BAT) replication ability is limited by the inefficiencies of Transmission Control Protocol (TCP). TCP replacements have made strides in recent years and have solved many of the problems that limit the ability of TCP to move bytes, especially in low-bandwidth, high-latency networks. This project implements an alternative to TCP. The WARP Network Optimizer project addresses a critical warfighter capability gap identified in a Central Command Joint Urgent Operational Needs Statement. The objective of this project is to replace TCP with Circadence's WARP software, which is a commercial product that uses an optimized protocol. WARP creates a tunnel between two endpoints using their protocol. All TCP traffic on a specific port between these two endpoints will use WARP. The payoff is an optimized protocol which will give a net gain in replication.		0.890	-
FY 2010 Accomplishments:			

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
This project is in the process of conducting a limited field test between two replication nodes to determine the utility to the BAT enterprise. If successful, the software will be installed in theater.			
Title: Biometrics Automated Toolset (BAT) Replicator Description: The current BAT replication component, called Discovery and Synchronization Service (DSS) was created as a prototype before the required functionality and performance were well understood, and when the data load was very small compared to the current BAT enterprise requirement. DSS is based on a legacy design that makes further maintenance costly and slow. This project developed an alternative BAT replicator and addressed a critical warfighter capability gap identified in a CENTCOM Joint Urgent Operational Needs Statement (JUONS). The objective of this project is to replace the current DSS software with a more robust solution that is easier to implement and maintain. FY 2010 Accomplishments: The Replacement BAT Replicator project: (1) defined the functional requirements of the replicator; (2) produced a limited functionality alpha build; and (3) began a full function test readiness review. The executable software installation package is the primary deliverable that was deployed to end users, which included a user guide and help material. In addition to the software itself, the engineering process produced documented requirements and design documentation.		0.390	-
Title: Enabling Effective Emulation and Tests for Biometric Automated Toolset (BAT) Data Distribution Description: This project built an emulation of the current Afghanistan BAT data distribution topology to conduct elaborate test scenarios. In addition, this project built the long-term BAT data distribution scheme using central BAT server and attachment servers, top-down database replication and selective attachment replication. This project addresses a critical warfighter capability gap identified in a CENTCOM JUONS. The project payoff is that test results from the resulting emulations will feed into the transition plan for the future design of BAT data distribution. FY 2010 Accomplishments: The principal investigators constructed the testbed for the BAT emulation and produced a test report based on elaborate BAT data distribution test scenarios. This project produced actionable recommendations for the improved BAT data distribution design, implementation, and operation and will continue to serve as the foundation to troubleshoot BAT data distribution problem as needed in Afghanistan and other countries as well.		0.360	-
Title: Tactical Biometrics System (TBS) Communications Optimization (COMMOPT) Description: This project is creating file compression software that can be installed on legacy biometric equipment. This file compression software will allow for more efficient usage of existing bandwidth in theater. This project addressed a critical warfighter capability gap identified in a CENTCOM Joint Urgent Operational Needs Statement.		1.322	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
<i>FY 2010 Accomplishments:</i> The principal investigators demonstrated the capability for integration into legacy systems. This project reduced individual raw image file size up to 20:1 the normal size, other types of attachments up to 3:1 normal size, and compressed fingerprints up to 2:1. As a result, the required network bandwidth for synchronization activities may be more efficiently utilized by the Biometric Automated Toolset (BAT)/ Digital Synchronization Service (DSS), in turn allowing for enhanced operational performance.				
<i>Title:</i> Iris Identification Algorithm Evaluation for Biometric Automated Toolset (BAT) and Future Systems <i>Description:</i> This project evaluated the performance of iris identification algorithms to enable the selection of the algorithm with the highest expected operational performance and interoperability for BAT and future DoD systems. This project independently evaluated each algorithm in concert with the current BAT hardware to produce bench mark metrics for each algorithm's accuracy, computational efficiency, and interoperability to be used as a basis for selecting the best algorithm for BAT and other systems.		0.045	-	-
<i>FY 2010 Accomplishments:</i> The Iris Identification Algorithm Evaluation for BAT and Future Systems: (1) built the testbed; (2) evaluated several iris matching algorithms; and (3) began compiling a test report. This project created baseline metrics for the current BAT iris identification algorithms. With the completed baseline, the principal investigators tested various other leading iris matching algorithms to identify those with the highest performance. The final output of this project developed a way forward to identify key image quality features impacting interoperability and performance.				
<i>Title:</i> Field User Evaluation of Standoff Facial Recognition and Automated Registration <i>Description:</i> The Tactical Analysis of Video Imagery (TAVI) system is a real-time video analysis, face recognition, and human activity recognition system. People detected near the same time and in the same area can be connected by the software, and these connections are analyzed with social network analysis to determine the affiliations of those people monitored. The payoff is to produce a system whereby a Forward Operating Base (FOB) will be supported by two wide-area surveillance cameras mounted on portable masts to look at an overview of the area, as well as four pan/tilt/zoom (PTZ) cameras mounted on rugged tripods at the corners of each FOB. The wide-area and PTZ cameras work together to provide automated tracking, and face recognition of observed targets at distances up to 40m. In addition, two long range cameras suitable for doing face recognition at 100m chokepoints are provided. The long range cameras will be mounted on pan-tilt stages for manual camera control.		0.790	0.170	-
<i>FY 2010 Accomplishments:</i>				

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
The project demonstrated a prototype of the system at Empire Challenge. The Principal Investigator is currently waiting on the delivery of additional equipment that will support the evaluation for the remaining FOBs. The effort consisted of development and delivery of a TAVI system for five FOB units. . FY 2011 Plans: The project will conduct system testing; user manual writing; and user training.				
Title: Accelerated Nuclear DNA Equipment (ANDE) Description: The purpose of the field-deployable ANDE program is to enable automated rapid DNA profiling, while minimizing analytical complexity and user manipulations, for battlefield biometric and forensic applications. The prototypes will enable warfighters without technical training to generate and match DNA profiles directly from buccal swab reference samples in approximately one hour. A consortium of other U.S. Government sponsors (Defense Threat Reduction Agency, Federal Bureau of Investigation, National Institute of Justice, and Department of Homeland Security) has committed funding of \$18.600 million for the program. Intent is to produce: (1) one DNA analysis prototype and 100 consumable cartridges for DNA processing; (2) forensic sample collection and processing methods; and (3) procedures, data analysis, communication, and information security elements for the ANDE system. FY 2010 Accomplishments: The project developed a Risk Reduction Plan; conducted first and second quarter reviews; demonstrated individual module integration; developed a manufacturing plan; and conducted the Preliminary Design Review. FY 2010 dollars will continue to produce outputs in FY 2011. FY 2011 Plans: In FY 2011, the project will conduct the Critical Design Review; conduct the System Acceptance Test; and deliver three prototypes to DoD.		5.615	0.674	-
Title: Aptamer Selection and Integration in Nanoparticle-Based Detection Systems Description: This project will discover novel biological recognition elements, specifically DNA and/or RNA oligomers known as aptamers that bind with high specificity and sensitivity to molecules of interest. Several different platforms are being investigated at the Air Force Research Laboratory in order to convert this binding event into optical and electrical signals which allow for implementation into a handheld sensor. The primary output of this program is to deliver a selection method for aptamers that can be used to detect multiple chemicals and detection assays for multiple analytes which have been examined with several platforms, as well as a prototype microfluidic field effect transistor sensor. FY 2010 Accomplishments:		0.315	-	0.180

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
<p>The program studied and selected aptamers using published protocols. FY 2010 funds will continue to produce outputs in FY 2011.</p> <p>FY 2011 Plans: In FY 2011, the project will develop a new discovery method for aptamers and functionalize various types of nanoparticles for better assay performance.</p> <p>FY 2012 Plans: The project will demonstrate multi-target detection and integrate the aptamers into a modular chip platform for multiplex assays and long-term application into complex matrices.</p>			
<p>Title: Rapid DNA Processing Initiative</p> <p>Description: This initiative is examining alternative technologies to expedite the identification, collection and processing of DNA samples in an expeditionary environment. This includes the development of technology to process DNA using alternative microfluidic technologies as well as training on existing and future DNA sampling techniques. The primary output of this program is to develop an alternative rapid DNA processing capability that will allow the warfighter to produce a DNA profile in less than 60 minutes in the expeditionary environment.</p> <p>FY 2010 Accomplishments: This initiative delivered a low rate production prototype to be tested and evaluated by the warfighter. The initiative demonstrated a prototype that can process DNA in under 90 minutes. FY 2010 dollars will continue to produce output in FY 2011. The project is improving on existing research with the goal to process a DNA sample in less than 60 minutes.</p> <p>FY 2011 Plans: In FY 2011, this project will deliver a prototype for testing and evaluation purposes.</p>		2.100	-
<p>Title: Age of Latent Fingerprints for Tracking Suspects</p> <p>Description: This project is investigating the feasibility of using DNA or other chemicals in a latent fingerprint to determine the age of that particular print. It is known that DNA degrades at ambient conditions. This project is determining the time course for this degradation and evaluating whether it can be used to estimate when a suspect made that fingerprint. The objective of this work is to determine if DNA degradation can be correlated with exposure time to ambient conditions.</p> <p>FY 2010 Accomplishments: The investigators evaluated DNA and cell degradation from samples seeded on different surfaces.</p> <p>FY 2011 Plans:</p>		0.335	0.395

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
The investigators will evaluate DNA degradation from latent fingerprints and provide a final report evaluating feasibility of this technique.			
Title: Novel Specimen Collection, Storage, and Analysis Description: This project developed a new way to collect and retain chemical and biological specimens from solid surfaces, liquid solutions or gas streams. The method uses ionic liquids as a selective and stable mobile phase. The ionic liquid itself is contained in a high surface area applicator, such as a swab or gel. The objective of this project is to develop specimen collection devices (swabs) that are selective and very stable. FY 2010 Accomplishments: The project measured the basic physical properties of four diverse ionic liquids.		0.285	-
Title: Rapid, Automated Sample Preparation for Biological Assays Description: This project is developing a rapid microfluidic-based system to process raw environmental and/or clinical samples and extract the DNA for downstream analysis by any platform. The technology utilizes acoustic, thermal, and electric fields to separate out contaminants such as debris or pollen, lyse open cells, and extract the DNA from the lysate. The objective is to deliver performance data of contaminate removal using acoustic chips, performance data of DNA recovery from spiked samples and environmental samples, and microfluidic chips for integration into existing assay platforms. FY 2010 Accomplishments: The project developed the acoustic filter which includes the fabrication of the acoustic device, testing of the separation of contaminants from cells, and reporting on the performance of contaminate removal. FY 2011 Plans: In FY 2011, the investigators will demonstrate on-chip lysis of target cells, demonstrate and quantify DNA recovery, and deliver microfluidic chips for integration with an existing assay platform.		0.670	-
Title: Automated Image Processor for Latent Prints Description: This project developed an automated document exploitation system capable of processing latent prints via optical rather than chemical imaging. In addition, the final prototype will send the biometric images (total document and fingerprint/palmprint biometrics) to a biometric database using standard transmission formats. This project output is to develop a revolutionary optical document latent print scanner that will considerably decrease the processing time of latent prints. This will be accomplished using optical, non contact fingerprint detection technologies that can be integrated with existing Federal Bureau of Investigation (FBI) certified fingerprint imaging systems.		0.890	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
FY 2010 Accomplishments: Initial laboratory test results indicated the quality of the resulting image will be a function of the paper on which the latent fingerprint is found and of any additional residual contents (human oil, different materials, etc.) left by the finger on the paper. For algorithm development, the Processor for Latent Prints demonstrated the ability to automatically detect in a synthetic environment multiple fingerprints placed randomly on various size and background papers including a sample with high text content.				
Title: Lanthanide Oxide Nanoparticles for Fumeless Latent Fingerprint Detection and Image Processing Description: This project used lanthanide oxide nanoparticles to specifically bind to fingerprint residue and provide for fluorescence detection under broadband ultraviolet illumination to develop latent prints without traditional fuming techniques. The objective is to create the ability to eliminate the fuming process for latent fingerprint detection, allowing for “real-time” in-field processing capability. The capability is taking the current five step fingerprint detection process down to three simple steps: apply nanoparticles (spray), image, and process. By eliminating the need for a special fuming chamber, the fingerprint detection process can be made more efficient and effective. FY 2010 Accomplishments: The project conducted testing on various surfaces to evaluate the potential for using the lanthanide oxide nanoparticles. The project conducted testing on various surfaces to evaluate the potential for operationally using the lanthanide oxide nanoparticles.		0.100	-	-
Title: Integrated Multi-Test Sensor System for Battlefield Forensics Description: This effort developed an integrated multi-dimensional sensor system that provides for real-time fast forensic analysis of unknown chemical materials. The resulting device offers superior reliability (negligible-false alarms) along with high sensitivity, detection of a wide range of analytes and built-in redundancy while meeting the low-cost, weight/size and power requirements of a hand-held forensic system. The project will integrate three key components: an optical interferometer, a planar electrochemical cell, and thin film chromatography, into a single system. The system will provide identification and quantification of compounds in real time, in the field, which currently requires processing of samples in a remote analytical laboratory. FY 2010 Accomplishments: The project developed a system design and demonstrated the optical detection capability that will be integrated into the prototype.		0.270	-	-
Title: Tactical Latent Camera Description: This project is developing a field-ready system designed to collect latent fingerprints under tactical conditions by Special Operations Forces (SOF) operators. This project will develop a tactical device to capture high quality fingerprints. The device will simplify the collection of prints by the operator, and provide higher quality captures for Latent Print Examiners (LPEs) to investigate. The process will streamline the data transfer of captured print files, and reduce the involvement of LPEs.		0.490	0.600	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
FY 2010 Accomplishments: An earlier stage prototype was developed and is currently in testing.			
FY 2011 Plans: The project will conduct final system enhancement and will deliver ten (10) pre-production prototypes to DoD.			
Title: Computational Iris Capture Camera Prototype and Demonstration (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will improve image quality and reduce motion blur for handheld iris enrollments using a fluttering shutter technique. The flutter shutter technique has applications for both iris and facial imaging systems. FY 2011 Plans: This project will develop a near infra-red iris image capture camera incorporating the developed flutter shutter techniques.		-	0.850
Title: Non-Contact Biometric Hand Scanner (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop a non-contact, mobile hand print biometric capture system that is capable of capturing three dimensional images of all five fingers and the palm in a single presentation. FY 2011 Plans: This project will provide an operational brass board of the biometric system that can capture and process the prints on a whole hand.		-	0.850
Title: Improving Iris Recognition Matching of Off Angle and Dilated Non-Ideal Data (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will research an approach to improve performance in segmenting and matching iris data that is captured at angles greater than 20 degrees off-angle. FY 2011 Plans: This project will provide image processing and pattern recognition algorithms to improve the performance of iris recognition at off-angles as well as algorithm testing results.		-	0.780
Title: Handheld Unconstrained Iris Camera (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will address the challenges associated with warfighters capturing iris biometric data of freely moving subjects, at oblique angles, and in suboptimal lighting conditions such as bright sunlight.		-	0.850

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
FY 2011 Plans: This project will provide image processing and pattern recognition algorithms to improve the performance of iris recognition at off-angles as well as algorithm testing results.				
Title: Biometric Scientific Research Assessment (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will identify and assess biometric related academic research. The purpose of this assessment is to identify those biometric disciplines that are critical to the national security mission but have not received significant research in the academic community. FY 2011 Plans: This project will provide a catalog of existing biometric research published by academia and a final report that identifies opportunities for investment in future research.		-	0.260	-
Title: Portable Low Temperature Plasma Miniature Mass Spectrometer (LTP Mini-MS) (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop a hand-portable mass spectrometer device for the detection of explosives, chemical weapons agents, drugs of abuse, gunshot residues, and other toxic and hazardous chemical compounds. This significant reduction in size enables the warfighter to conduct chemical forensic analysis on site, and eliminates lengthy delays from transporting samples back to laboratories. Of note, this project was formally known as Desorption Electrospray Ionization Mass Spectrometer (DESI) but was changed due to improvements in the technical approach. FY 2011 Plans: This project will deliver four miniature mass spectrometer systems and provide documentation and performance information.		-	0.510	-
Title: Stokes Image Sensor for Non-invasive and Rapid Latent Fingerprint Detection (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop a portable system that can rapidly capture a latent fingerprint without affecting the print. This system will use an optical technique to image latent prints using spatially resolved polarization phase shifts of a probe laser. FY 2011 Plans: The first phase will include the development of a test bed and a proof of principle test to demonstrate the Stokes Image Sensor capabilities. FY 2012 Plans:		-	0.350	0.300

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Exhibit R-2A, RDT&E Project Justification: PB 2012 Office of Secretary Of Defense		DATE: February 2011	
APPROPRIATION/BUDGET ACTIVITY 0400: <i>Research, Development, Test & Evaluation, Defense-Wide</i> BA 3: <i>Advanced Technology Development (ATD)</i>	R-1 ITEM NOMENCLATURE PE 0603665D8Z: <i>Biometrics Science and Technology</i>	PROJECT P665: <i>Biometrics Science and Technology</i>	
B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011
The second phase will develop and deliver a prototype of the portable Stokes Image Sensor.			
Title: Low Cost, Portable, 3D Ballistic Imaging System using Structured Light Illumination (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop a low cost, portable, three-dimensional ballistic imaging system that will speed the transfer and analysis of evidence while improving the comparison of ballistic samples. FY 2011 Plans: This project will provide a prototype system that leverages a structured light imaging technique to capture ballistic information.		-	0.500
Title: Comprehensive Organic and Inorganic Characterization of Gunshot Residue (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop analytical protocols that will target inorganic and organic constituents of firearm discharge residues through exploitation of proven principals of ionic/molecular chemistry. This research will allow for a field detection capability that can leverage existing technology and commercially available instrumentation, while reducing the problematic high false positive rate of current detection systems. FY 2011 Plans: This project will demonstrate the feasibility of using ion mobility spectrometry and tandem mass spectrometry to detect the inorganic constituents of gunshot residue.		-	0.480
Title: Forensic Analysis Spectral Imaging Tool (FASIT) (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will develop a technology to rapidly locate trace forensic evidence and areas of interest within the battlefield environment using specific wavelength bands of light. FY 2011 Plans: This project will provide two prototype systems for use in expeditionary lab environments with associated technical and training manuals.		-	0.480
Title: Extraction of Chemical Residue with Fingerprint Transfer and Lifts (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will research the ability to gain ultra-trace information from gathered biometrics to aid the warfighter in identifying potential evidence of trace explosives, chemical weapons, biological weapons, and drugs.		-	0.360

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
FY 2011 Plans: This project will develop an ultra-trace forensic workstation coupled to mass spectrometry for analysis of transferred chemical residue.				
Title: Single-use Sensor Strips for Reliable Field Analysis of Gunshot Residues (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will investigate the ability to immediately identify individuals that fired a weapon in a battlefield environment using electrochemical stripping voltammetry. This technique is currently used by the medical community for blood testing and will be adapted for a battlefield forensic application. FY 2011 Plans: This project will develop a hand-held prototype device, using disposable sensor strips, for gunshot residue field detection with appropriate software and documentation.		-	0.311	-
Title: Detection and Imaging of Undeveloped Latent Fingerprints (funding contingent upon congressional appropriation and/or new start authorization) Description: This project will research the appropriate technique (optical, chemical, and thermal imaging) for locating and capturing latent fingerprints on a variety of surfaces. This will enable forensics labs to more efficiently detect and image undeveloped latent fingerprints on a range of objects. FY 2011 Plans: This project will provide research and a final report on the performance of the various imaging techniques studied with appropriate recommendations for use and further development.		-	0.666	-
Title: Forensic Scene Modeling (funding contingent upon congressional appropriation and/or new start authorization) Description: Description: This project will seek to address the requirement to quickly and accurately document a scene or event for future forensic analysis. A market survey will be conducted to determine current commercial capabilities and an investment will be made to develop, demonstrate and evaluate a technical solution. FY 2011 Plans: This project will provide an assessment of available capabilities offered by the commercial sector as well as the infrastructure to evaluate potential solutions.		-	1.080	-
Title: Biometric and Forensic Technical Evaluation (funding contingent upon congressional appropriation and/or new start authorization)		-	0.450	-

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B. Accomplishments/Planned Programs (\$ in Millions)		FY 2010	FY 2011	FY 2012
Description: This effort will assess biometric and forensic prototypes that have been transitioned to DoD. The assessment will focus on evaluating software and hardware deliverables from completed projects to determine the potential for transition and fielding to the warfighter. FY 2011 Plans: This project will produce test results and a report that provides overall recommendations and a suggested path forward for the biometric and forensic technology being evaluated.				
Title: FY 2012 Expeditionary Forensic Science and Technology Description: Continue support in developing new technologies that will provide an emerging expeditionary forensic capability to the warfighter and commander within DoD. The Biometrics Program will develop the requirements and solicit proposals for FY 2012 during FY 2011 and to select projects by the end of Q4 FY 2011 FY 2012 Plans: The investment for FY 2012 will support gaps identified by commanders in the areas of reducing time on target to collect forensic data and increasing the amount of analysis that can be done in a field environment vice a laboratory environment. Projects will be selected after coordination with organizations throughout DoD and other U.S. Government Departments and Agencies to maximize collaborative investment and prevent redundant research.		-	-	3.634
Title: FY 2012 Biometric Science and Technology Description: Continue support in developing new technologies that will provide an emerging biometric capability to the warfighter and commander within DoD. The Biometrics Program will develop the requirements and solicit proposals for FY 2012 during FY 2011 and to select projects by the end of Q4 FY 2011. FY 2012 Plans: The investment for FY 2012 will support gaps identified by commanders in the areas of increasing standoff distance for collection and exploring the use of emerging modalities. Projects will be selected after coordination with organizations throughout DoD and other U.S. Government Departments and Agencies to maximize collaborative investment and prevent redundant research.		-	-	6.648
Accomplishments/Planned Programs Subtotals		15.967	11.416	10.762

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C. Other Program Funding Summary (\$ in Millions)

N/A

D. Acquisition Strategy

N/A

E. Performance Metrics

Defense Biometrics Science & Technology (S&T strategy) is to annually assess biometric and forensic technology gaps in the Department's combined S&T portfolio, and sponsor projects that help close those gaps. These projects are designed to advance immature technologies and deliver a prototype. This strategy was initiated in FY 2008 concurrent with the first year of funding, and the first five projects each delivered prototypes in October 2009.

In FY 2010, nine projects were completed with prototype or final product delivery, and all nine (100%) were transitioned to the Army to provide technology infusion or inform the formal acquisition process for the Joint Personnel Identification and Biometric Enabling Capability programs of record. Additional development will be required for these prototypes prior to selection for production. Another project, sponsored jointly with DHS, is scheduled for delivery and transition by the end of 1Q FY 2011.

In addition, project performance metrics specific to each effort are identified in the project plan, and individual project success will be monitored through these metrics. The metrics include items such as target dates from project work break down schedules, production measures, production goals, production numbers and demonstration goals and dates.

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